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Medicine

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Leaflet No. 6
(Revised 1941)
Occupational Information and Guidance Service

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MEDICINE [1]

By WALTER J. GREENLEAF

Specialist in Occupational Information and Guidance

[This leaflet is one of a series on ocupations: What the occupations are; what preliminary education is required; where training is offered; length of training; student budgets; and selected references. The series is designed for use of high school and college students and classes, and of guidance committees, counselors, teachers, and parents.]

MEDICINE AS A CAREER

Hippocrates, known as the father of medicine, established the practice and study of medicine in Greece during his lifetime 460 to 357 B. C. His students were bound by a solemn obligation or oath, modifications of which may be used today in the medical schools. One translation of this oath from the Greek reads as follows:

Hippocratic Oath.—"I swear by Apollo, the physician, and Aesculapius, and Health, and All-heal and by all the gods and goddesses, making them my judges, that I will fulfill this mine oath as far as my power and judgment permit: To esteem my teacher in this art equally with my parents; to share my livelihood with him, and if in want, to share my substance. To regard his offspring as my brothers, teaching them this art without fee if they shall wish to learn it; to instruct by precept, by lecture, and in all other ways my sons, the sons of him who taught me, and those teachers bound by oath and stipulation according to the law of medicine, but no others. I will carry out treatment of the sick and will keep them from harm and wrong. To none will I give a deadly drug even if solicited, nor offer counsel to such an end. * * * With purity and holiness will I keep my life and my art. * * * Into whatsoever houses I enter, I will go for the benefit of the sick, abstaining from all voluntary wrong. I will keep silence regarding that which, within or without my practice, I shall see or hear in the lives of men, which should not be made public, holding that all such things should be kept secret. And now if I shall fulfill this oath and do not break it, may the fruits of life and of art be mine; may I be honored of all men for all time; the reverse if I shall transgress and violate this oath."

Today the physician, or doctor of medicine, is engaged in the cure and prevention of disease in the individual and in the promotion of public health and welfare. According to the Dictionary of Occupational Titles,[2] a physician is a person of recognized experience, educational, and legal qualifications who may be "engaged in such phases of medicine as diagnosing, prescribing medicines for, and otherwise treating diseases and disorders of the human body, and performing

[1] The material in this leaflet has been furnished in large part by the American Medical Association, 535 N. Dearborn, Street, Chicago, Ill.

[2] Dictionary of Occupational Titles. U. S. Employment Service, U. S. Department of Labor, Washington, D. C., 1939. Part I, Definitions of Titles, 1,287 p. $2.; part II, Titles and Codes, 330 p. $1.

surgery and operations." As a public-health agent he studies the causes of disease and premature death, and applies the knowledge of these causes for their prevention. He is responsible both for the life of the patients under his care, and for the protection of the life and health of others. He must be endowed with a large share of patience and perseverance, his powers of observation must be keen, his physical condition must withstand intensive study, tedious days, and broken rest, and his time and energy must be given freely to alleviate human suffering. The majority of doctors are general practitioners past 33 years of age who anticipate a long period of activity.

Census.—There are more physicians in proportion to population in the United States than in any other country in the world;175,382 physicians are listed in the 1940 American Medical Association Directory as practicing in continental United States, or approximately 1 doctor to every 751 inhabitants. Although the present supply of doctors may be adequate for the country as a whole, distribution is uneven in the States and varies from 1 doctor to every 1,300 or more persons in Alabama, Mississippi, North Carolina, and South Carolina, to 1 for every 600 or fewer persons in California, Colorado, District of Columbia, and Massachusetts.

Need and supply of medical care.—In a survey made by the Bureau of Medical Economics (Medical Care in the United States—Demand and Supply, 1939) it was pointed out that, although there are probably at all times and in all places some deficiencies in medical care, these deficiencies are believed to be fewer in the United States than in any other country, and that in only a few localities is any significant percentage of the population unable to obtain the medical care which it needs and desires. Another survey from the United States Department of Labor (Study of Money Disbursements of Wage Earners and Clerical Workers, Serial No. R. 1118) shows that among 14,469 families studied in 42 large cities, the average expenditure for medical care was $59 per family or $16 per person for 12 months within the period 1934–1936. This figure includes all charges for medical, dental, and hospital services, drugs and medicines, medical appliances, and health-insurance premiums. Most of these families paid for their medical care on an individual fee-for-service basis rather than under a form of group medical care.

Opportunities.—Besides engaging in private practice, medical graduates may enter salaried positions on either a full-time or a part-time basis. The most usual employment is found in hospitals; public-health service in Federal, State, county, or municipal departments; teaching and research in universities; industrial organizations; school medical inspection; the Army and the Navy; the Veterans' Bureau; and group practice. Positions are also available as physicians' assistants; insurance examiners; laboratory specialists; medical employees of railroads, sanatoriums, and institutions; clinical specialists; medical research workers; and workers in other miscellaneous occupations.

Women in medicine.—There are about 7,470 women physicians in the United States. All medical schools in the United States admit women except Georgetown, Emory, Harvard, St. Louis, Dartmouth, Hahnemann, and Jefferson. The first woman to receive a M. D. degree in the United States was Elizabeth Blackwell, who was graduated in 1849 from the Geneva Medical College (now Syracuse University College of Medicine).

Gross income.[3]—In 1939 the *gross* incomes of physicians in the United States were studied by Medical Economics, Inc., Rutherford, N. J., and published in the Medical Economics Journal for September 1940. Findings from this study based on 7,565 reports reveal that gross incomes averaged $7,365; that a physician's earning capacity reaches its maximum between the 13th and 17th years of practice while he is in his forties; and that the average gross income for 1,663 specialists was $10,057.

Table 1.—*Average gross income of 5,522 general practitioners in 1939*

Years of practice and geographic area		Population of community		
		Under 2,500	2,500–100,000	More than 100,000
(1)		(2)	(3)	(4)
Less than 13 years	East	$5,921	$6,851	$5,113
	West	6,424	7,812	6,159
	South	5,121	7,088	6,790
13 to 27 years	East	6,252	8,589	7,201
	West	5,044	8,880	7,743
	South	5,124	7,431	8,652
More than 27 years	East	4,192	6,890	6,028
	West	4,403	6,196	5,942
	South	3,623	5,335	5,953

License to practice.—Statutory requirements in most States provide that to practice medicine in any State a doctor must (1) be a graduate of a reputable medical school, (2) pass a licensing examination before a State board, and (3) register annually with some officer in the county of practice. In addition, as shown in table 2, a hospital internship is required in 21 States, the District of Columbia, Alaska, Hawaii, and Puerto Rico. Citizenship is required in most States. Every State has its own board of medical examiners or department of registration and, since medical practice acts of the various States differ, those desiring licensure in a particular State should obtain the regulations for practice directly from the State board in question. Reciprocity is a measure provided for in most States whereby applicants who have passed licensing examinations in one State may, at the discretion of the examining board, be admitted without examination to practice in another State.

[3] Gross income includes all receipts before expenses are deducted and is not to be confused with net income which is income over and above expenses.

Table 2.—*License to practice (licensure requirements by States)*

Examinations held at—	Examination fee	Basic science certificate is required	Citizenship is required	Internship is required	Time of examinations
(1)	(2)	(3)	(4)	(5)	(6)
Alabama, Montgomery	$10	.....	X [1]	X	June.
Arizona, Phoenix	25	X	.....	.....	January, April, July, October.
Arkansas	15	X	X	.....	June, December.
California	25	.....	.....	X [3]	Announced.
Colorado, Denver	25	X	X [2]	.....	January, April, July, October.
Connecticut	25	X	X [1]	.....	March, July, November.
Delaware	25	.....	X	X	July.
District of Columbia, Washington.	25	X	.....	X	January, July.
Florida	25	X	X	.....	June, November.
Georgia, Atlanta; Augusta	20	.....	X	.....	June, October.
Idaho, Boise	25	.....	.....	X	April, October.
Illinois, Chicago	10	.....	X [1]	X	January, April, June, October.
Indiana, Indianapolis	25	.....	X	.....	June.
Iowa, Iowa City; Des Moines	25	X	X	X	June; Announced for Des Moines.
Kansas, Topeka	25	.....	X	.....	June, December.
Kentucky, Louisville	25	.....	X	.....	June, December.
Louisiana, New Orleans	25	.....	X [1]	X	June, December.
Maine	25	.....	X [1]	.....	March, July, November.
Maryland	20	.....	X [1]	.....	June, December.
Massachusetts	25	.....	X [1]	.....	March, July, November.
Michigan, Ann Arbor; Detroit; Lansing.	25	X	X	X	June (October at Lansing).
Minnesota	20	X	X	.....	January, April, June, October.
Mississippi, Jackson	10	.....	X	.....	June.
Missouri	15	.....	X	.....	June, October.
Montana, Helena	50	.....	X	.....	April, October.
Nebraska, Lincoln; Omaha	25	X	X	.....	June, November.
Nevada	25	.....	X [2]	.....	Announced.
New Hampshire, Concord	20	.....	X	X	March, September.
New Jersey, Trenton	25	.....	X	X	June, October.
New Mexico, Santa Fe	50	.....	.....	.....	April, October.
New York, Albany; Buffalo; New York; Syracuse.	25	.....	X [1]	.....	January, June, September.
North Carolina, Raleigh	15	.....	X	.....	June.
North Dakota, Grand Forks	25	.....	X	X	January, July.
Ohio, Columbus	25	.....	X	.....	June, December.
Oklahoma	25	X	X	X	June, December.
Oregon, Portland	25	X	.....	X	January, July.
Pennsylvania, Philadelphia; Pittsburgh.	25	.....	X [1]	X	January, July.
Rhode Island, Providence	20	X	X [1]	X	January, April, July, October.
South Carolina, Columbia	25	.....	X	.....	June, November.

[1] First papers for United States citizenship must be taken out by those from abroad.

[2] Declaration of intention to become a citizen.

[3] Internship required of foreign medical graduates.

Table 2.—*License to practice (licensure requirements by States)*—Con.

Examinations held at—	Examination fee	Basic science certificate is required	Citizenship is required	Internship is required	Time of examinations
(1)	(2)	(3)	(4)	(5)	(6)
South Dakota	$20	X	X	X	January, July.
Tennessee	10	.....	X	.....	Announced.
Texas	25	.....	X	.....	June, November.
Utah	25	.....	X [2]	X	Announced.
Vermont, Burlington	20	.....	X	X	Announced.
Virginia	25	.....	X	.....	June, December.
Washington, Seattle	25	X	X [1]	X	January, July.
West Virginia	25	.....	.....	X	Announced.
Wisconsin, Madison; Milwaukee.	25	X	.....	X	January, June.
Wyoming	25	.....	X	X	June, October.
Alaska, Juneau	25	.....	X	X	March, September.
Hawaii, Honolulu	25	.....	X	X	January, April, July, October.
Puerto Rico, San Juan	25	.....	X	X	March, September.

[1] First papers for United States citizenship must be taken out by those from abroad.
[2] Declaration of intention to become a citizen.

National board of medical examiners.—The National Board of Medical Examiners, 225 South Fifteenth Street, Philadelphia, Pa., was organized in 1915 to establish in this country a standard qualifying examination of such a character that certificates awarded successful candidates can be safely accepted by all State boards of medical licensure as an adequate qualification for the practice of Medicine. Certificates of the board are (1940) recognized in 43 States, in the District of Columbia, and Alaska, Canal Zone, Hawaii, and Puerto Rico. Examinations (registration fee $5) are conducted in three groups as follows: Part I—a written examination in the six fundamental medical sciences—anatomy, including histology and embryology; physiology; biochemistry; pathology; bacteriology, including immunology; pharmacology and materia medica ($20); part II—a written examination in medicine, including neuropsychiatry and therapeutics; surgery; obstetrics and gynecology; public health, including hygiene and medical jurisprudence; and pediatrics ($20); part III—a clinical and practical examination available in 22 cities ($40).

American Medical Association.—The American Medical Association, 535 North Dearborn Street, Chicago, Ill., serves professional interests of physicians, and aims to promote the science and art of medicine and the betterment of public health. The Council on Medical Education and Hospitals, a subdivision created by the association in 1904, has completely revolutionized the character of the required preparation for the practice of medicine. The council investigates and reports annually on medical colleges, students, graduates, State medical licensing boards, hospitals, dispensaries, and clinical laboratories, and publishes a statis-

tical survey on medical education in the educational number of the Journal of the American Medical Association.

Specialists.—A specialist is a doctor who limits his work to a particular field of medicine as listed in the American Medical Directory. For some years a need has been evident for a national and uniform standard governing all fields of medical practice to differentiate properly qualified physicians from the self-appointed specialists. Therefore, in June 1934 the council adopted standards governing the approval of the specialty boards listed below.

In practice a specialist must keep in close contact with the new developments in the field or fields related to his specialty by constant reading of professional literature, by frequent attendance at medical meetings, and by activity in meetings of hospital staffs and medical societies.

New graduates often specialize at once without obtaining experience in general practice. Following the successful completion of an internship, they may accept a "residency" or long period of full-time training in one of the specialties in a hospital.

In 1938, 33,618 specialists, representing about a fifth of the total number of doctors, limited their practice to: Internal medicine (25 percent); surgery (18 percent); ear, nose, and throat (17 percent); obstetrics and gynecology (7 percent); urology (5 percent); ophthalmology (4 percent); neurology (4 percent); orthopedics (3 percent); dermatology (3 percent); psychiatry (2 percent); and miscellaneous (12 percent).[4]

Specialists tend to locate in the larger cities, but there is also a tendency because of overcrowding for many to find their way to the smaller communities.

Examining Boards in Medical Specialties.—Sixteen boards are now organized for the certification of specialists. Minimum qualifications which are required include: Graduation from an approved medical school, an internship of not less than 1 year in a hospital acceptable to the council, and a period of specialized training of at least 3 years in a selected field. The boards (*a*) determine whether candidates have received adequate preparation as defined; (*b*) provide a comprehensive test of the ability and fitness of such candidates; and (*c*) certify to the competence of these physicians who have satisfied the requirements.

These boards are as follows:

1. American Board of Pediatrics, Inc., 1933
   707 Fullerton Avenue, Chicago, Ill.
2. American Board of Psychiatry and Neurology, Inc., 1934
   1028 Connecticut Avenue, NW., Washington, D. C.
3. American Board of Orthopedic Surgery, Inc., 1934
   1640 State Street, New Orleans, La.
4. American Board of Dermatology and Syphilology, 1932
   416 Marlboro Street, Boston, Mass.
5. American Board of Radiology, Inc., 1932
   102 Second Avenue, SW., Rochester, Minn.

[4] Percents based on 1938 figures of the A. M. A. (33,618 specialists).

6. American Board of Urology, Inc., 1934
1009 Nicollet Avenue, Minneapolis, Minn.
7. American Board of Obstetrics and Gynecology, Inc., 1930
121 S. Highland Avenue, Pittsburgh, Pa.
8. American Board of Internal Medicine, 1936
1301 University Avenue, Madison, Wis.
9. American Board of Pathology, Inc., 1936
2799 West Grand Boulevard, Detroit, Mich.
10. American Board of Ophthalmology, 1917
6830 Waterman Avenue, St. Louis, Mo.
11. American Board of Otolaryngology 1924
107 S. Seventeenth Street, Omaha, Nebr.
12. American Board of Surgery 1937
225 South Fifteenth Street, Philadelphia, Pa.
13. American Board of Anesthesiology, Inc. 1937
745 Fifth Avenue, New York, N. Y.
14. American Board of Plastic Surgery 1937
400 Metropolitan Building, St. Louis, Mo.
15. American Board of Neurological Surgery
404 Brown Building, Louisville, Ky.
16. American Board of Proctology,
7815 East Jefferson Avenue, Detroit, Mich.

TRAINING

Admission to premedical schools.—Before entering a medical school preliminary education in premedical work is required. Candidates who receive their preliminary education in institutions approved by accrediting agencies acceptable to the council are given preference although exceptions are made in the case of other applicants who have demonstrated superior ability. A list of colleges of arts and sciences approved by national and regional educational associations may be obtained from the council. Although 3 years or more in college is recommended, the minimum preliminary education which is acceptable to the council for admission to approved medical schools is 2 years of college training including; English, theoretical and practical courses in physics, biology, and general and inorganic chemistry.

Admission to college presupposes the completion of 4 years of secondary school or the equivalent. The council does not specify the courses which should be taken in secondary schools, nor those which should be chosen as electives in colleges, but recommends a general education which is as broad as possible. Preparation for and admission to college will therefore follow the usual requirements prevailing in the different sections of the country.

Admission to medical schools.—Of the 77 approved medical schools in the United States in 1941, 68 have adopted requirements in excess of the minimum of 2 premedical years acceptable to the council; 56 require 3 years; 5 admit

students with 3 years of college work if the baccalaureate degree is conferred in absentia at the end of the first year of medicine; one requires 4 years; 6 require a baccalaureate degree prior to admission to medical school; and 9 require 2 premedical years only.

In 1931 the Association of American Medical Colleges passed a resolution recommending the use of aptitude tests in the selection of medical students. The majority of medical schools now use aptitude test scores as one measure in selecting students for entrance. The director of study of the College Association's Committee on Aptitude Tests for Medical Schools is Dr. F. A. Moss, 1835 Eye Street NW., Washington, D. C.

Basic medical sciences.—The basic medical sciences including anatomy, histology, embryology, biochemistry, physiology, pharmacology, bacteriology, immunology, and pathology are usually offered in the first 2 years of medicine as preclinical instruction. Medical schools located in small communities are not able to provide clinical material for teaching and therefore maintain only 2 years of a 4-year course. Ten of these schools (see table 2) offer only the basic medical sciences and after 2 years, their students transfer to the 4- or 5-year medical schools to complete their training.

Medical education.—The standard 4-year curriculum recognized by the council consists of from 3,600 to 4,400 hours, distributed as from 900 to 1,000 hours per year, as follows, each group to be allotted approximately the percentage of hours of the whole number of hours in the courses as stated:

	Hours	*Percent*
1. Anatomy, including embryology and histology	14.0	18.5
2. Physiology	4.5	6.0
3. Biochemistry	3.5	4.5
4. Pathology, bacteriology, and immunology	10.0	13.0
5. Pharmacology	4.0	5.0
6. Hygiene and sanitation	3.0	4.0
7. General medicine	20.0	26.5
(Neurology and psychiatry; pediatrics; dermatology and syphilis)		
8. General surgery	13.0	17.5
(Orthopedic surgery; urology; ophthalmology; otolaryngology; roentgenology)		
9. Obstetrics and gynecology	4.0	5.0
Total	76.0	100.0
Electives	24.0	....

The course of study in 52 medical schools covers in general 4 calendar years of approximately 32 weeks each, although in 4 universities (Northwestern, Minnesota, Duke, and Tennessee) a student may shorten the period somewhat by taking work in summer quarters or summer sessions.

Hospital internship.—Internship in a hospital provides the medical student with a period of practical experience under supervision before he begins independent practice. The intern assumes increasing responsibility for the diagnosis of diseases, daily observations, care and treatment of patients under his service. In a straight internship a young physician is assigned and his training is limited to *one* department. Rotating internships provide a variety of in-

struction and opportunity; in approved hospitals (730 listed March 1941) fifth-year medical students find experience in medicine, surgery, pediatrics, obstetrics, pathology, and radiology. Intern service is at least 12 months in length, involves little or no expense to the student, includes board and room, and frequently pays a small monthly stipend.

Internship is required for the M. D. degree in the University of California, College of Medical Evangelists, University of Southern California, Stanford University, Loyola University, Northwestern University, University of Illinois, Wayne University, University of Minnesota, Duke University, University of Cincinnati, and Marquette University.

Internship is required by Medical Licensing Boards of all candidates in:

Alabama	Illinois	Oklahoma	Vermont
Alaska	Iowa	Oregon	Washington
Delaware	Louisiana	Pennsylvania	West Virginia
District of Columbia	Michigan	Puerto Rico	Wisconsin
Hawaii	New Hampshire	Rhode Island	Wyoming
Idaho	New Jersey	South Dakota	
	North Dakota	Utah	

Although only 12 medical schools require students to complete a fifth year as interns in approved hospitals before being eligible for the M. D. degree, 21 States and the District of Columbia require the intern year as a prerequisite for a license to practice, and 98 percent of all medical students obtain this experience whether it is required or not.

MEDICAL SCHOOLS—1941

Since 1933 the American Medical Association has listed 77 medical schools in the United States which have been recognized by the Council on Medical Education and Hospitals. Ten of these offer only the first 2 years of the medical course of study. By choosing one of these 77 institutions a student will not only obtain superior training in medicine, but after graduation his diploma will be recognized by the State medical boards, and he will be eligible to enter examination to secure a license to practice in the State of his choice.

Tuition and other expenses.—The majority of medical schools in 1920 charged about $180 for tuition and fees, increasing in 1925 to $250, and in 1930 to $305.

In 1940 tuition and fees for the first year in the medical schools varied from $138 to $656, and averaged $471. State universities hold rates at a minimum, especially for residents of the State in which the university is located; 24 such institutions charge an average of $285 to State residents, but add nonresident fees for students coming from other States. For instance, a resident of Illinois pays only $150 for tuition and fees in the University of Illinois Medical School, but an out-of-State resident must pay $225 annually for the same course. (For information relating to individual schools, see table 3 column 6.)

Other expenses for a medical education are relatively high compared with the costs of training in other professions, and the 2 or 3 year premedical requirement adds materially to the total cost. In some instances expenses may be reduced

by scholarships and personal economy, but a medical student will find so much of his time occupied with class work and study, that he will have little opportunity for self-support during term-time.

A student budget of $1,200 annually for 4 years of 36 weeks each would provide for all necessary expenses including tuition; books, instruments, and rental of a microscope, $100 a year; laboratory fees, $20; board estimated at $1 per day; room at 50 cents per day; laundry $1 per week. Incidentals, not including the cost of travel, clothing, or clubs, must be limited to $173 if expenses are to be kept within the $1,200 limit.

Estimated student budget

Tuition (average—1940)	$471
Books and instruments	100
Laboratory fees	20
Board and room	400
Laundry	36
Incidentals	173
Freshman year	1,200

Table 3.—*Approved medical schools in the United States*

Medical schools—Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parentheses)
(1)	(2)	(3)	(4)	(5)	(6)
ARKANSAS					
1. University of Arkansas School of Medicine, Little Rock.	2	4	278	63	$505($280)
CALIFORNIA					
2. University of California Medical School, Berkeley-San Francisco.	3	5	241	60	577 (277)
3. College of Medical Evangelists, Loma Linda-Los Angeles.	2	5	316	101	612
4. University of Southern California School of Medicine, Los Angeles.	3	5	202	43	452
5. Stanford University School of Medicine, Stanford University-San Francisco.	3	5	240	55	530
COLORADO					
6. University of Colorado School of Medicine, Denver.	3	4	204	51	546 (301)
CONNECTICUT					
7. Yale University School of Medicine, New Haven.	3	4	208	44	505

Table 3.—*Approved medical schools in the United States*—Continued

Medical schools—Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parentheses)
(1)	(2)	(3)	(4)	(5)	(6)
DISTRICT OF COLUMBIA					
8. Georgetown University School of Medicine, Washington.	Degree.....	4	326	80	$500
9. George Washington University School School of Medicine, Washington.	2.....	4	248	48	550
10. Howard University College of Medicine, Washington.	2.....	4	119	33	269
GEORGIA					
11. Emory University School of Medicine, Atlanta.	3.....	4	219	50	338
12. University of Georgia School of Medicine, Augusta.	3.....	4	166	33	445 (225)
ILLINOIS					
13. Loyola University School of Medicine, Chicago.	3.....	5	302	115	510
14. Northwestern University Medical School, Chicago.	3.....	5	556	156	414
15. University of Chicago, Rush Medical College.	3.....	4	212	106	450
16. University of Chicago, The School of Medicine.	3.....	4	273	35	450
17. University of Illinois College of Medicine, Chicago.	3.....	5	636	162	225 (150)
INDIANA					
18. Indiana University School of Medicine, Bloomington-Indianapolis.	3.....	4	460	105	422 (217)
IOWA					
19. State University of Iowa College of Medicine, Iowa City.	3.....	4	293	71	460 (196)
KANSAS					
20. University of Kansas School of Medicine, Lawrence-Kansas City.	3.....	4	294	69	267 (157)
KENTUCKY					
21. University of Louisville School of Medicine, Louisville.	2.....	4	341	84	450

Table 3.—*Approved medical schools in the United States*—Continued

Medical schools—Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parentheses)
(1)	(2)	(3)	(4)	(5)	(6)
LOUISIANA					
22. Louisiana State University School of Medicine, New Orleans.	3.....	4	351	136	$533 (133)
23. Tulane University of Louisiana School of Medicine, New Orleans.	3.....	4	471	120	552
MARYLAND					
24. Johns Hopkins University School of Medicine, Baltimore.	Degree.....	4	279	68	621
25. University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.	3.....	4	370	100	656 (506)
MASSACHUSETTS					
26. Boston University School of Medicine, Boston.	3.....	4	205	54	479
27. Harvard Medical School, Boston.....	2.....	4	522	132	425
28. Tufts College Medical School, Boston..	Degree.....	4	386	96	512
MICHIGAN					
29. University of Michigan Medical School, Ann Harbor.	3.....	4	466	125	400 (250)
30. Wayne University College of Medicine, Detroit.	3 and degree..	5	245	60	425 (325)
MINNESOTA					
31. University of Minnesota Medical School, Minneapolis.	3.....	5	454	104	400 (250)
MISSOURI					
32. St. Louis University School of Medicine, St. Louis.	3.....	4	418	106	530
33. Washington University School of Medicine, St. Louis.	4.....	4	345	95	524
NEBRASKA					
34. Creighton University School of Medicine, Omaha.	3.....	4	231	57	493 (393)
35. University of Nebraska College of Medicine, Omaha.	3.....	4	320	76	219

Table 3.—*Approved medical schools in the United States*—Continued

Medical schools—Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parentheses)
(1)	(2)	(3)	(4)	(5)	(6)
NEW YORK					
36. Albany Medical College, Albany	Degree	4	128	29	$455
37. Long Island College of Medicine, Brooklyn.	3	4	354	81	610
38. University of Buffalo School of Medicine, Buffalo.	2	4	259	56	530
39. Columbia University College of Physicians and Surgeons, New York.	3	4	413	102	545
40. Cornell University Medical College, New York.	3 and degree	4	292	70	620
41. New York Medical College, Flower and Fifth Avenue Hospitals, New York.	Degree	4	278	50	645
42. New York University College of Medicine, New York.	3	4	495	124	600
43. University of Rochester School of Medicine and Dentistry, Rochester.	3	4	200	45	500
44. Syracuse University College of Medicine, Syracuse.	3	4	170	40	500
NORTH CAROLINA					
45. Duke University School of Medicine, Durham.	3	4	259	58	450
OHIO					
46. University of Cincinnati College of Medicine, Cincinnati.	3	5	303	66	535 (485)
47. Western Reserve University School of Medicine, Cleveland.	3 and degree	4	265	58	[1] 542
48. Ohio State University College of Medidine, Columbus.	3	4	307	77	477 (327)
OKLAHOMA					
49. University of Oklahoma School of Medicine, Oklahoma City.	3	4	231	52	578 (178)
OREGON					
50. University of Oregon Medical School, Portland.	3	4	240	49	440 (380)
PENNSYLVANIA					
51. Hahnemann Medical College and Hospital of Philadelphia.	3	4	543	127	515
52. Jefferson Medical College of Philadelphia.	Degree	4	497	125	455

[1] Rate for 1941–42.

Table 3.—*Approved medical schools in the United States*—Continued

Medical schools–Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parenthesis)
(1)	(2)	(3)	(4)	(5)	(6)
PENNSYLVANIA—Continued					
53. Temple University School of Medicine, Philadelphia.	3.....	4	446	119	$500
54. University of Pennsylvania School of Medicine, Philadelphia.	3.....	4	491	134	535
55. Woman's Medical College of Pennsylvania, Philadelphia.	3.....	4	103	18	447
56. University of Pittsburgh School of Medicine, Pittsburgh.	2.....	4	257	46	500
SOUTH CAROLINA					
57. Medical College of the State of South Carolina, Charleston.	3.....	4	171	40	422 (272)
TENNESSEE					
58. University of Tennessee College of Medicine, Memphis.	2.....	4	439	96	360 (210)
59. Meharry Medical College, Nashville...	3.....	4	196	39	300
60. Vanderbilt University School of Medicine, Nashville.	3 and degree..	4	200	54	415
TEXAS					
61. Baylor University College of Medicine, Dallas.	3.....	4	305	75	414
62. University of Texas School of Medicine, Galveston.	3.....	4	374	90	138
VERMONT					
63. University of Vermont College of Medicine, Burlington.	3.....	4	131	36	450 (300)
VIRGINIA					
64. University of Virginia Department of Medicine, Charlottesville.	3.....	4	254	62	469 (419)
65. Medical College of Virginia, Richmond.	3.....	4	295	66	469 (344)
WISCONSIN					
66. University of Wisconsin Medical School, Madison.	3.....	4	262	48	422 (222)
67. Marquette University School of Medicine, Milwaukee.	3.....	5	313	72	462
Average.....	.....	.....	.....	.....	471 (285)

Table 3.—*Approved medical schools in the United States*—Continued

Medical schools—Name and location	Premedical years required 1940–41	Academic years in course	Student enrollment 1939–40	Graduates 1939–40	Tuition and fees 1940–41 first year. (State resident fees in parenthesis)
(1)	(2)	(3)	(4)	(5)	(5)
APPROVED SCHOOLS OF THE BASIC MEDICAL SCIENCES					
ALABAMA					
68. University of Alabama School of Medicine, University (Tuscaloosa).	3.....	2	103	.....	$271
MISSISSIPPI					
69. University of Mississippi School of Medicine, University.	3.....	2	44	.....	403 (353)
MISSOURI					
70. University of Missouri School of Medicine, Columbia.	3.....	2	75	.....	191
NEW HAMPSHIRE					
71. Dartmouth Medical School, Hanover...	3 and degree..	2	42	.....	450
NORTH CAROLINA					
72. University of North Carolina School of Medicine, Chapel Hill.	3.....	2	79	.....	400 (300)
73. Wake Forest College School of Medical Sciences, Wake Forest.	3.....	2	60	.....	300
NORTH DAKOTA					
74. University of North Dakota School of Medicine, Grand Forks. [1]	3.....	2	49	.....	165 (80)
SOUTH DAKOTA					
75. University of South Dakota School of Medical Sciences, Vermillion.[1]	3.....	2	50	.....	250 (150)
UTAH					
76. University of Utah School of Medicine, Salt Lake City.	3.....	2	56	.....	304 (229)
WEST VIRGINIA					
77. West Virginia University School of Medicine, Morgantown.	2.....	2	45	.....	404 (254)

[1] Rate for 1941–42.

RELATED OCCUPATIONS

CLINICAL LABORATORY TECHNICIAN

According to the Dictionary of Occupational Titles, the medical technician performs duties in a hospital or medical laboratory making laboratory tests of urine, blood, animal parasites, infections, and animal inoculations; makes blood counts and smears; gives biological skin tests; prepares vaccines; types blood for transfusions, and may engage in research.

Training for this work is offered in 152 approved institutions. (For complete list and detail see the Journal of the American Medical Association, March 22, 1941). Candidates for admission to these schools should be able to satisfy one of the following requirements: (1) Two years of college work, including chemistry, biology, and physics from an accredited college, or (2) graduation from a recognized school of nursing and in addition college chemistry. At present graduate nurses may be accepted for enrollment.

The duration of training in these institutions is generally 12 months (93 institutions); 13–23 months in 30 institutions; 24 months in 6 institutions; and 4 years or more in the 23 institutions that admit high school graduates. The course of training includes: (1) Biochemistry, (2) hematology, (3) bacteriology, (4) parasitology, (5) histologic technic, and (6) serology.

In table 4 are listed 45 institutions which enrolled 10 or more students in 1941 and which are approved by the Council on Medical Education and Hospitals. These institutions enroll nearly three-fourths (72 percent) of the 1,760 students in training.

Table 4.—*Approved schools for clinical laboratory technicians* [1]

Schools	Admission requirement (college years)	Duration of training (months)	Enrollment
(1)	(2)	(3)	(4)
CALIFORNIA			
Los Angeles—Los Angeles County Hospital	Degree	15	12
COLORADO			
Denver—University of Denver School of Science and Engineering.	High school	4 yrs	60
GEORGIA			
Atlanta—Grady Hospital	Degree	12	12
Emory University—Emory University Graduate School	Degree	18	14
ILLINOIS			
Chicago—Michael Reese Hospital	2 yrs	12	13
Chicago—Northwestern University Medical School	2 yrs	12	10
KANSAS			
Kansas City—University of Kansas Hospitals	Degree	12	14

[1] For complete list of institutions see the Journal of the American Medical Association, March 22, 1941.

Table 4.—*Approved schools for clinical laboratory technicians*—Continued

Schools	Admission requirement (college years)	Duration of training (months)	Enrollment
(1)	(2)	(3)	(4)
KENTUCKY			
Lexington—University of Kentucky	High school	4 yrs	14
Louisville—Kentucky State Department of Health	2 yrs	12	20
LOUISIANA			
New Orleans—Loyola University	High school	5 yrs	66
MARYLAND			
Baltimore—Mercy Hospital	2 yrs	20	14
MICHIGAN			
Detroit—Henry Ford Hospital (Wayne University)	Degree	18	12
Detroit—Wayne University	High school	4 yrs	74
East Lansing—Michigan State College	High school	4 yrs	10
MINNESOTA			
Duluth—College of St. Scholastica	High school	4 yrs	46
Minneapolis—Minneapolis General Hospital	Degree	12	18
Minneapolis—University of Minnesota	High school	4 yrs	53
MISSOURI			
Kansas City—Kansas City Health Department Laboratories.	2 yrs	18	18
Kansas City—St. Joseph Hospital	Degree	15	12
Kansas City—St. Luke's Hospital	2 yrs	18	10
St. Louis—St. Louis University School of Nursing	High school	4 yrs	24
MONTANA			
Great Falls—College of Great Falls	High school	4 yrs	24
Missoula—Montana State University	High school	4 yrs	35
NEW YORK			
Albany—Bender Hygienic Laboratory	2 yrs	12	15
Buffalo—Buffalo General Hospital	Degree	13–15	12
Buffalo—Edward J. Meyer Memorial Hospital	2 yrs	12	10
Rochester—Rochester General Hospital	Degree	18	13
Troy—Russell Sage College	High school	4 yrs	14
NORTH CAROLINA			
Durham—Duke Hospital	2 yrs	18	20
OHIO			
Athens—Athens University	High school	4½ yrs	55
Cleveland—Institute of Pathology, Western Reserve University.	Degree	12	17
Mount St. Joseph—College of Mount St. Joseph-on-the-Ohio.	High school	4 yrs	28

Table 4.—*Approved schools for clinical laboratory technicians*—Continued

Schools	Admission requirement (college years)	Duration of training (months)	Enrollment
(1)	(2)	(3)	(4)
PENNSYLVANIA			
Bethlehem—Moravian College for Women	High school	4 yrs	56
Lewisburg—Bucknell University	High school	4½ yrs	30
Philadelphia—Temple University	High school	4 yrs	88
Reading—Albright College	High school	4½ yrs	18
TEXAS			
Dallas—Baylor University Hospital	2 yrs	12	13
Fort Worth—Texas Christian University	High school	4 yrs	15
Galveston—John Sealy Hospital	2 yrs	12	15
UTAH			
Salt Lake City—University of Utah School of Medicine	High school	4 yrs	48
VIRGINIA			
Charlottesville—University of Virginia Hospital	2 yrs	12	10
Richmond—College of William and Mary	High school	4 yrs	40
Richmond—Medical College of Virginia Hospital Division.	3 yrs	18	10
WASHINGTON			
Pullman—State College of Washington	High school	4½ yrs	45
WISCONSIN			
Madison—University of Wisconsin	High school	4 yrs	119
107 other institutions with less than 10 students each [1]			484
Total			1,760

PHYSICAL THERAPY TECHNICIAN

Physiotherapy is the treatment of disease by use of such natural forces as electricity, exercise, heat, water, light, air, and massage. The physical therapist, often a woman, is a technician who, under the advice of a physician, is trained to give treatments and to operate devices used in treatments. Training in this field is offered in 16 approved schools. Essentials of an acceptable school for physical therapy technicians were adopted by the council, passed by the House of Delegates of the American Medical Association on May 9, 1936, and printed in the Journal for August 29, 1936.

Requirements for admission.—Candidates for admission to the schools for physical therapy technicians should be able to pass a complete physical examination and satisfy one of the following requirements:

1. Two years or 60 semester hours of college, including courses in physics and biology. (6 schools only of those listed in table 5.)
2. Graduation from an accredited school of nursing (indicated in table 5 by the initials R. N. which means registered nurse).
3. Graduation from an accredited school of physical education (indicated in table 5 by initials P. E.).

For those preparing to enter physical therapy, courses in general physics, chemistry, and biology are recommended.

Minimum curriculum.—The course of study in an approved school for physical therapy technicians averages 12 months. Not less than 9 months should be spent in the following subjects:

	Hours of theory	Hours of laboratory and practice training
Anatomy (including applied anatomy, demonstration on cadaver, and lecture)	210	...
Clinical practice	..	400
Electrotherapy	30	45
Ethics and administration	5	...
Hydrotherapy	5	15
Massage	15	45
Pathology	30	...
Physiology	30	45
Principles of physical therapy as applied to:		
Medicine	15	30
Neurology	10	15
Orthopedics	15	30
Surgery (including surgical observation)	15	30
Psychology	15	...
Therapeutic exercise	30	75
Electives (suggested electives: Asepsis, bandaging, first aid, history of physical therapy, records, social service)	45	...
Subtotals	470	730
Total	1,200 hours	

Graduates in 1940 numbered 135 students. In March 1941 there were 206 students enrolled. Tuition rates are shown in table 5. For further information apply to the secretary of the American Physiotherapy Association, 5 Rico Way, San Francisco, Calif., or to the American Registry of Physical Therapy Technicians, 30 North Michigan Avenue, Chicago, Ill.

Table 5.—*Approved schools for physical therapy technicians*

Schools	Student body	Minimum entrance requirement [1]	Duration of course (months)	Award	Tuition	Student enrollment
1	2	3	4	5	6	7
CALIFORNIA						
California Hospital, Los Angeles	Co-ed	2 yrs. coll.; Grad. P. E.; R. N.	18 mos	Cert	$200	6
Children's Hospital, Los Angeles	Women	2 yrs. coll.; Grad. P. E.; R. N.	15 mos	Diploma	150	14
Stanford University, Stanford University	Co-ed	H. S.; 2 yrs. coll.; Grad. P. E.; R. N.	12 mos 4 yrs	Cert B. A. degree	fees	6
DISTRICT OF COLUMBIA						
Walter Reed General Hospital	Women	Grad. P. E.	12 mos	Cert	none	15
ILLINOIS						
Northwestern University Medical School, Chicago	Co-ed	3 yrs. coll.; Grad. P. E.; R. N.	9 mos	Cert	200	12
MASSACHUSETTS						
Bouve-Boston School of Physical Education, Boston	Women	H. S. Grad	3 yrs 4 yrs	Diploma B. S. degree	400	12
Harvard Medical School,[1] Boston	Women	Grad. P. E.; R. N.	9 mos	Cert	150	20
Boston University, Sargent College of Physical Education, Cambridge.	Women	H. S. Grad	4 yrs	B. S. degree	432	24
Posse Institute, Kendal Green	Women	H. S. Grad	3 yrs	Diploma	400	15

MINNESOTA						
Mayo Clinic, Rochester	Co-ed	Grad. P. E.; R. N.	12 mos.	Cert.	none	20
MISSOURI						
St. Louis University, School of Nursing, St. Louis	Co-ed	H. S. Grad	4 yrs	B. S. degree	250	4
NEW YORK						
University of Buffalo, School of Nursing, Buffalo	Co-ed	2 yrs. coll.; Grad. P. E.; R. N.	12 mos.	Cert.	375	10
Hospital for Ruptured and Crippled, New York	Co-ed	2 yrs. coll.; Grad. P. E.; R. N.	9 mos.	Diploma	300	20
PENNSYLVANIA						
D. T. Watson School of Physiotherapy, Leetsdale, affiliated with University of Pittsburgh School of Medicine.	Co-ed	2 yrs. pre-med.; Grad. P. E.	2 yrs	Diploma (or B. S.)	none	8
VIRGINIA						
College of William and Mary, Richmond	Women	Coll. grad.; R. N.	9 mos.	Cert. (or B. S.)	200	10
WISCONSIN						
University of Wisconsin, Medical School, Madison	Co-ed	Grad. P. E.; R. N.	12 mos.	Cert.	fees	10
Total						206

[1] R. N.—Registered Nurse; P. E.—Physical Education; H. S.—High School.

OCCUPATIONAL THERAPIST

Occupational therapy is a treatment, particularly for disabled patients in hospitals or institutions for the physically or mentally handicapped, through occupational activity as a curative agent. Differentiation is now being made between technicians in *diversional* (recreational) therapy, and those who are trained to accomplish *therapeutic* (curative) results by a scientifically planned program of occupation.

The occupational therapist should be a person of good judgment and ability, skilled in craft work, and able to cooperate with physicians and patients in hospital routine. Most practitioners are women.

Training for this work is offered in five approved schools in the United States and one in Canada—the University of Toronto, Department of University Extension. (See table 6.) Revised essentials of an acceptable school of occupational therapy are published in the Journal of the American Medical Association, March 26, 1938.

Admission.—A candidate for admission to a school of occupational therapy should be a high-school graduate with at least 1 year and preferably 2 years of college work; must have good character, general fitness, and good health; must pass an annual medical examination; and must be at least 21 years of age at graduation.

Course of study.—Twenty-five calendar months of 100 weeks full-time training is required: 15 semester hours devoted to theoretical training in (1) biologic sciences—anatomy, kinesiology, neurology, physiology, psychiatry, psychology; (2) 4 semester hours in social sciences—sociology, delinquency and crime, social and educational agencies; (3) 4 semester hours in theory of occupational therapy; (4) 4 semester hours in clinical subjects; and (5) electives—3 semester hours. A minimum of 30 semester hours should be devoted to technical training in (1) the field of therapeutic arts and crafts—design, leather, etc.; (2) the field of educational therapy; and (3) the field of recreational therapy. Clinical training requires 9 months in mental, tuberculosis, general, children's and orthopedic hospitals.

A graduate whose training in occupational therapy is approved is entitled to use O. T. R. (Registered Occupational Therapist) after her name in the same manner that a registered nurse uses R. N. after her name. For further information write to the secretary of the American Occupational Therapy Association, 175 Fifth Avenue, New York, N. Y.

Table 6.—*Approved schools of occupational therapy*

School	Year organized	Entrance requirement (college years)	Duration of course (years)	Tuition for entire course	Enrollment
(1)	(2)	(3)	(4)	(5)	(6)
MASSACHUSETTS					
Boston School of Occupational Therapy, Boston.	1918	1	3.....	$900	76
MICHIGAN					
Kalamazoo State Hospital School of Occupational Therapy,[1] Kalamazoo.	1922	1	27 mos.....	467	28
MISSOURI					
St. Louis School of Occupational and Recreational Therapy,[2] St. Louis.	1918	2	3.....	975	30
PENNSYLVANIA					
Philadelphia School of Occupational Therapy, Philadelphia.	1918	1	3.....	650	96
WISCONSIN					
Milwaukee-Downer College—Department of Occupational Therapy,[3] Milwaukee.	1913	1	3.....	750	98

[1] Affiliated with Western State Teachers College for B. S. Degree in 5 years.
[2] Affiliated with University College of Washington University for B. S. Degree in 5 years.
[3] Also course leading to B. S. degree in 5 years.

NOTE: Columbia University, New York City, through University Extension beginning September 1941, offers a program of professional studies leading to a Certificate of Proficiency in Occupational Therapy, open to qualified students who have completed one year or more of college. The curriculum consists of 2 years of professional courses followed by 9 months of clinical training. Tuition and fees per year $390.

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